

What is Claimed is:

1. A method for manufacturing a belt structure comprising the steps of:

providing tapes made of resin surrounding a
5 fibrous matrix;

applying CD oriented tapes to the surface of a mandrel;

applying MD oriented tapes over the CD tapes;

applying pressure and heat to the mandrel
10 containing the CD and MD tapes so to melt the resin and encapsulate the fibrous matrix; and

treating the belt structure thus obtained to set.

2. The method claimed in claim 1, wherein the
15 resin is thermoplastic and is caused to thermoset during the step of treating the belt structure.

3. The method claimed in claim 1, further comprising the step of grinding a surface of the
20 belt structure to a desired caliper.

4. The method claimed in claim 1, further comprising the step of forming grooves or blind drilled holes on a surface of the belt structure.
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5. The method claimed in claim 1, wherein pressure is applied by wrapping a shrinkable film around the mandrel containing the CD and MD tapes.

30 6. The method claimed in claim 1, wherein the resin is a solid thermoplastic elastomeric resin

containing irradiation activated cross linking compounds.

7. The method claimed in claim 1, wherein
5 radiation energy is applied to thermoset the resin.

8. The method claimed in claim 1 further
comprising the step of cooling the resin-
encapsulated matrix to solidify the resin, after the
10 heating step.

9. The method claimed in claim 1, wherein some
or all of the tapes comprise rubber.

10. The method claimed in claim 1 further
15 comprising the step of repairing defects on the belt
structure.

11. The method claimed in claim 1, wherein the
20 fibrous matrix provides reinforcement and includes
one of continuous fiber filaments, woven tapes, and
knitted tapes with continuous reinforcing threads.

12. The method claimed in claim 1, wherein
25 said MD tapes are applied in a spiral fashion.

13. The method claimed in claim 1, wherein the
order of layering the MD and CD tapes is reversed.

14. The method claimed in claim 1, wherein at
30 least one resin layer is applied to the mandrel
surface prior to applying the MD and CD tapes.

15. The method claimed in claim 1, wherein at least one resin layer is applied over the MD and CD tapes after the tapes are in place.

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16. The method claimed in claim 1, wherein at least one resin layer is applied between the MD and CD tapes but not fully cured.

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17. The method claimed in claim 1, wherein the belt structure is one used as a shoe press belt for use in shoe calenders.

18. A belt structure made in a manner comprising the steps of:

15 providing tapes made of resin surrounding a fibrous matrix;

applying CD oriented tapes to the surface of a mandrel;

20 applying MD oriented tapes over the CD tapes;

applying pressure and heat to the mandrel containing the CD and MD tapes so to melt the resin and encapsulate the fibrous matrix; and

25 treating the belt structure thus obtained to cause a jelling of the resin.

19. The belt structure claimed in claim 18, wherein the resin is thermoplastic and is caused to thermoset during the step of treating the belt structure.

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20. The belt structure claimed in claim 18, further comprising the step of grinding a surface of the belt structure to a desired caliper.

5 21. The belt structure claimed in claim 18, further comprising the step of forming grooves or blind drilled holes on a surface of the belt structure.

10 22. The belt structure claimed in claim 18, wherein pressure is applied by wrapping a shrinkable film around the mandrel containing the CD and MD tapes.

15 23. The belt structure claimed in claim 18, wherein the resin is a solid thermoplastic elastomeric resin containing irradiation activated cross linking compounds.

20 24. The belt structure claimed in claim 18, wherein radiation energy is applied to thermoset the resin.

25 25. The belt structure claimed in claim 18, further comprising the step of cooling the resin-encapsulated matrix to solidify the resin, after the heating step.

30 26. The belt structure claimed in claim 18, wherein some or all of the tapes comprise rubber.

27. The belt structure claimed in claim 18, further comprising the step of repairing defects on the belt structure.

5 28. The belt structure claimed in claim 18, wherein the fibrous matrix provides reinforcement and includes one of continuous fiber filaments, woven tapes, and knitted tapes with continuous reinforcing threads.

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29. The belt structure claimed in claim 18, wherein said MD tapes are applied in a spiral fashion.

15 30. The belt structure claimed in claim 18, wherein the order of layering the MD and CD tapes is reversed.

20 31. The belt structure claimed in claim 18, wherein at least one resin layer is applied to the mandrel surface prior to applying the MD and CD tapes.

25 32. The belt structure claimed in claim 18, wherein at least one resin layer is applied over the MD and CD tapes after the tapes are in place.

30 33. The belt structure claimed in claim 18, wherein at least one resin layer is applied between the MD and CD tapes but not fully cured.

34. The belt structure claimed in claim 18,
wherein the belt structure is a shoe press belt.